
स्वचालित सीढ़ियाँ और चलपथ

भाग 1 / अनुभाग 2 आयोजन एवं
चयन की मार्गदर्शिका
(पहला पुनरीक्षण)

Escalators and Moving Walks

Part 1/Section 2 Guide for Planning
and Selection
(First Revision)

ICS 91.140.90

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FOREWORD

This Indian Standard (Part 1/Sec 2) (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Lift and Escalators Sectional committee had been approved by the Electrotechnical Division Council.

This standard contains extracts of “EN 115 : 1995 + A1 : 1998 + A2 : 2004 Safety rules for the construction and installation of escalators and passenger conveyors” reproduced with the permission of CEN.

The guidelines for installation and maintenance of escalators were earlier covered in IS 4591 : 1968. There has been tremendous increase in usage of escalators during the past decade. Considering that escalators are being used by many without much of knowledge of its operation, it is necessary that safety aspects are taken care in the manufacturing of escalators. Keeping this in view and also to align the requirements with international practices, this standard is being revised and is being brought out in three sections as follows:

- IS 4591 (Part 1/Sec 1) : 2020 Escalators and moving walks: Part 1/Section 1 Safety requirements
(*first revision*)
- IS 4591 (Part 1/Sec 2) : 2020 Escalators and moving walks: Part 1/Section 2 Guide for planning and selection
(*first revision*)
- IS 4591 (Part 1/Sec 3) : 2020 Escalators and moving walks: Part 1/Section 3 Inspection and Test
(*first revision*)

With the publication of these standards, IS 4591 : 1968 stands withdrawn.

The objective of this standard is to provide requirements for electric escalators and moving walks that carry passengers.

The contents of this standard are based on the assumption that persons using escalators and moving walks are able to do so unaided. However, physical and sensory abilities in a population can vary over a wide range, escalators and moving walks are also likely to be used by persons with a range of other disabilities.

Some individuals, in particular older people, might have more than one impairment. Some individuals are not able to use an escalator or moving walk independently and rely on assistance/support being provided by a companion. Furthermore, some individuals can be encumbered by objects or be responsible for other persons, which can affect their mobility. The extent to which an individual is incapacitated by impairments and encumbrances often depends on the usability of products, facilities and the environment.

The use of wheelchairs on escalators and moving walks can lead to dangerous situations which cannot be mitigated by machine designs and therefore should not be permitted.

The use of lifts is the preferred method of vertical travel for most people with disabilities and in particular wheelchair users and persons with guide dogs.

Additional signs should be provided to indicate the location of other facilities, these facilities should be in close proximity to the escalators and moving walks and easy to find.

It is assumed that negotiations have been made for each contract between the customer and the supplier/installer about:

- a) intended use of the escalator or moving walk;
- b) environmental conditions;
- c) civil engineering problems; and
- d) other aspects related to the place of installation.

If escalators or moving walks are intended to be operated under special conditions, such as, directly exposed to the weather or explosive atmosphere, or in exceptional cases serve as emergency exits, appropriate design criteria, components, materials and instructions for use should be used that satisfy the particular conditions.

(Continued on third cover)

*Indian Standard***ESCALATORS AND MOVING WALKS****PART 1/SECTION 2 GUIDE FOR PLANNING AND SELECTION***(First Revision)***1 SCOPE**

1.1 This standard (Part 1/Sec 2) is applicable for all new escalators and moving walks (pallet or belt type) as defined in 3.

1.2 This standard does not deal with hazards arising from seismic activities.

1.3 This standard is not applicable to escalators and moving walks which were manufactured before the date of its publication. It is, however, recommended that existing installations be adapted to this standard.

1.4 The requirements for “Semi-outdoor” installations of escalator need to be discussed and finalized between the customer and manufacturer as these requirements impact both the civil design of the installation as well as the design of the escalator.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

<i>IS No.</i>	<i>Title</i>
3043 : 2018	Code of practice for earthing (<i>second revision</i>)
4591 (Part 1/Sec 1) : 2020	Escalators and moving walks: Part 1/Sec 1 Safety requirements
4591 (Part 1/Sec 3) : 2020	Escalators and moving walks: Part 1/Sec 3 Inspection and Test Indian Electricity Act and Rules

3 TERMS AND DEFINITIONS – SYMBOLS AND ABBREVIATIONS**3.1 Terms and Definitions**

For the purposes of this document, the terms and definitions given below shall apply.

3.1.1 Angle of Inclination — Maximum angle to the horizontal in which the steps, the pallets or the belt move.

3.1.2 Balustrade — Part of the escalator/moving walk which ensures the user’s safety by providing stability, protecting from moving parts and supporting the handrail.

3.1.3 Balustrade Decking — Transverse member of the balustrade which meets the handrail guidance profile and which forms the top cover of the balustrade.

3.1.4 Brake Load — Load on the step/pallet/belt which the brake system is designed to stop the escalator/moving walk.

3.1.5 Comb — Pronged section at each landing that meshes with the grooves on steps/pallets/belts.

3.1.5.1 Comb plate — Platform at each landing to which the combs are attached.

3.1.6 Electrical Safety System — Safety related part of the electrical control system as an arrangement of safety circuits and monitoring devices.

3.1.7 Electrical Safety Devices — Part of a safety circuit consisting of safety switches and/or fail safe circuits.

3.1.8 Escalator — Power-driven, inclined, continuous moving stairway used for raising or lowering persons in which the user carrying surface (for example, steps) remains horizontal.

NOTE — Escalators are machines even when they are out of operation, and cannot be considered as fixed staircases.

3.1.9 Exterior Panel — Part of the exterior side of the enclosure of an escalator or moving walk.

3.1.10 Fail Safe Circuit — Safety related electrical and/or electronic system with defined failure mode behavior.

3.1.11 Handrail — Power-driven moving rail for persons to grip while using the escalator or moving walk.

3.1.12 Interior Panel — Panel located between the skirting or lower inner decking and the handrail guidance profile or balustrade decking.

3.1.13 Decking

3.1.13.1 Lower inner decking — Profile that connects the skirting with the interior panel when they do not meet at a common point.

3.1.13.2 Lower outer decking — Profile that connects the exterior panels with the interior panel.

3.1.14 Machinery — Escalator or moving walk machine(s) mechanisms and associated equipment.

3.1.15 Machinery Spaces — Space(s) inside or outside of the truss where the machinery as a whole or in parts is placed.

3.1.16 Maximum Capacity — Maximum flow of persons that can be achieved under operational conditions.

3.1.17 Moving Walk — Power-driven installation for the conveyance of persons in which the user carrying surface remains parallel to its direction of motion and is uninterrupted (for example, pallets, belt).

NOTE — Moving walks are machines — even when they are out of operation — and should not be used as a fixed access.

3.1.18 Newel — End of the balustrade.

3.1.19 Nominal Speed — Speed in the direction of the moving steps, pallets or the belt, when operating the equipment under no load condition (that is, without

persons), stated by the manufacturer as that for which the escalator or moving walk has been designed.

NOTE — Rated speed is the speed the escalator/moving walk moves under rated load conditions.

3.1.20 Rated Load — Load which the equipment is designed to move.

NOTE — For maximum capacity, see 4.1.

3.1.21 Rise — Vertical distance between the upper and lower finished floor levels.

3.1.22 Safety Circuit — Part of the electric safety system consisting of electrical safety devices.

3.1.23 Skirting — Vertical part of the balustrade interfacing with the steps, pallets or belt.

3.1.24 Skirt Deflector — Device to minimize the risk of trapping between the step and the skirting.

3.1.25 Stand-by Operation — Mode in which an escalator/moving walk can be stopped or operated under no load condition with any speed below the nominal speed.

3.2 Symbols and Abbreviations

For symbols and corresponding units of measurement used in this standard see Table 1.

4 GUIDELINES FOR SELECTION AND PLANNING OF ESCALATORS AND MOVING WALKS

4.1 Maximum Capacity

For traffic flow planning, the maximum number of persons that can be carried by an escalator or moving walk in one hour is given in Table 2.

Table 1 Symbol and Corresponding Unit of Measurement Used in this Standard
(Clause 3.2)

SI No. (1)	Symbol (2)	Designation (3)	Unit (4)	Figure (5)
i)	b_9	Horizontal distance between the outer edge of the handrail and a non-continuous obstruction, for example, roof intersection, column	mm	1
ii)	b_{10}	Horizontal distance between the outer edge of the handrail and a continuous obstruction, for example, wall	mm	1
iii)	b_{11}	Horizontal distance between the handrail of adjacent escalators/moving walks	mm	1
iv)	b_{12}	Vertical distance between the lower edge of the handrail and the balustrade decking	mm	4
v)	h_4	Free height above any point of step surface, pallet or belt over the area between both edges of handrails	m	1, 3
vi)	h_5	Height of deflector	m	3, 5
vii)	h_{12}	Height of the upper edge of the free space outside the handrail	mm	1
viii)	α	Angle of inclination of the escalator or moving walk	° (degree)	3
ix)	β	Design angle of the teeth of the comb	° (degree)	—

Table 2 Maximum Capacity
(Clause 4.1)

Sl No.	Step/Pallet Width z_1		Nominal Speed v	
	m		m/s	
(1)	(2)	(3)	(4)	(5)
		0.50	0.65	0.75
i)	0.60	3 600 persons/h	4 400 persons/h	4 900 persons/h
ii)	0.80	4 800 persons/h	5 900 persons/h	6 600 persons/h
iii)	1.00	6 000 persons/h	7 300 persons/h	8 200 persons/h

NOTE — For moving walks with a pallet width in excess of 1.00 m, the capacity is not increased as users need to hold the handrail, the additional width is to principally enable the use of shopping trolleys and baggage carts.

4.2 Escalators or Moving Walks for Public Transport

For escalators or moving walks which are:

- part of a public transport system including entrance and exit points, or
- suitable for intensive use, regularly operating for approximately 140 h/week with a load reaching 100 percent of the brake load (see IS 4591 (Part 1/Sec 1) 5.4.2.1.3.1 and 5.4.2.1.3.3) for a total duration of at least 0.5 h during any time interval of 3 h,

it is recommended to install auxiliary brakes also for rises h_{13} less than 6 m.

The load conditions and additional safety features should be agreed between the manufacturer and the owner reflecting the traffic levels which exist.

5 REQUIREMENTS OF ESCALATORS AND MOVING WALKS INTENDED TO TRANSPORT SHOPPING TROLLEYS AND BAGGAGE CARTS

5.1 Escalators

The use of both shopping trolleys and baggage carts on escalators is unsafe and shall not be permitted.

The principle reasons why the use of these products is considered to be unsafe are foreseeable misuse, overloading and width restriction.

Where shopping trolleys and/or baggage carts are available in the area around escalator installations, suitable barriers shall be provided to prevent access.

5.2 Moving Walks

The use of suitably designed shopping trolleys and baggage carts on moving walks is permitted.

Shopping trolleys or baggage carts which are chosen for use on a moving walk shall be specified between the baggage cart manufacturer and the moving walk manufacturer. If non-specified shopping trolleys or

baggage carts are available in the moving walk area, there is a serious risk of misuse. It is necessary to prevent access to the moving walk entrance.

The width of the shopping trolley or baggage cart and its contents shall be at least 400 mm less than the nominal pallet/belt width. Passengers shall be able to leave the moving walk, even if shopping trolleys or baggage carts are on the moving walk.

For moving walks with an inclination greater than 6°, the rated speed shall be limited to 0.5 m/s.

Combs shall be designed with an angle β (refer IS 4591 (Part 1/Sec 1) Fig. 2) of max. 19° combined with a diameter of the shopping trolley or baggage cart roller of at least 120 mm diameter.

Additional stops for emergency situations at handrail level (taking into account 6.2.2) with a distance between 2.0 m and 3.0 m before the pallet reaches the comb intersection line shall be provided. The stop for emergency situations near the transition curve shall be reachable from inside the moving walk and the stops for emergency situations at exit(s) shall be reachable from outside of the moving walk.

Shopping trolleys or baggage carts shall conform to the moving walk design:

- The shopping trolley or baggage cart design shall ensure a safe and correct loading.
- The maximum weight for a shopping trolley or baggage cart shall be 160 kg when loaded.
- Shopping trolley or baggage cart shall automatically lock themselves on the inclined part of moving walks.
- Shopping trolley or baggage cart shall be fitted with a braking or blocking system.
- Shopping trolley or baggage cart shall have deflectors (bumpers) to reduce the risk of clamping.

5.2.1 For safe exit from the moving walk, it is necessary that the rear rollers of the shopping trolley or baggage

cart are able to push the front rollers over the comb. The front rollers and/or blocking system shall easily release from the pallet.

- Deflectors and guiding devices shall be added to the surrounding area to ensure correct alignment of shopping trolley or baggage cart when entering the moving walk.
- Safety signs about safe and correct use of the shopping trolley or baggage cart should be added.

6 BUILDING INTERFACES

6.1 General

The requirements in 6.2 and 6.3 are important for the safety of users and maintenance personnel.

If it is not possible for the manufacturers of the escalator or moving walk to fulfill these requirements (or some of them) due to the fact that, for example, they are not installing the escalator or moving walk, those

requirements that are not fulfilled have to be part of the instruction handbook as an obligation for the owner (see 7).

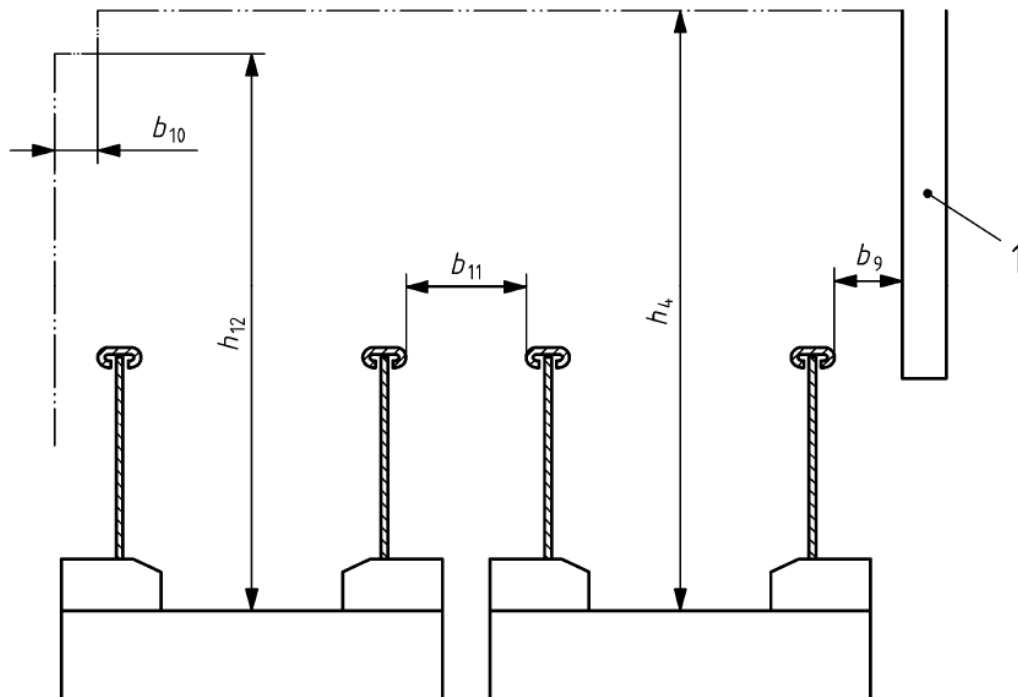
6.2 Free Space for Users

6.2.1 The clear height above the steps of the escalator or pallets or belt of the moving walk at all points shall be not less than 2.30 m (see h_4 in Fig. 1 and Fig. 3).

The clear height shall extend to the end of the newel.

NOTE — The clear height of 2.30 m should also be applied to the unrestricted area.

6.2.2 To prevent collision, a minimum free area around the escalator or moving walk is defined as per Fig. 1. The height h_{12} , measured from the steps of the escalator or the pallets or the belt of the moving walk shall be at least 2.10 m. The distance between the outer edge of the handrail and walls or other obstacles (see b_{10} in Fig. 1) shall under no circumstances be less than 80 mm horizontally and 25 mm vertically



Legend

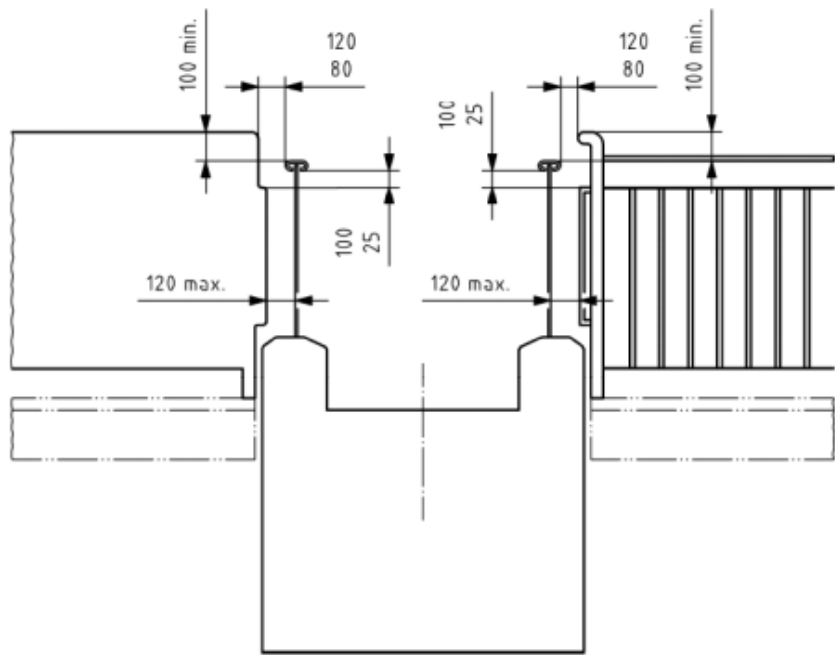
1 Obstacle (for example, wall or Column)

Principal Dimensions	Clause
$b_9 \geq 400 \text{ mm}$	6.2.4
$b_{10} \geq 80 \text{ mm}$	6.2.2
$b_{11} \geq 160 \text{ mm}$	6.2.3

Principal Dimensions	Clause
$h_4 \geq 2300 \text{ mm}$	6.2.1
$h_{12} \geq 2100 \text{ mm}$	6.2.2

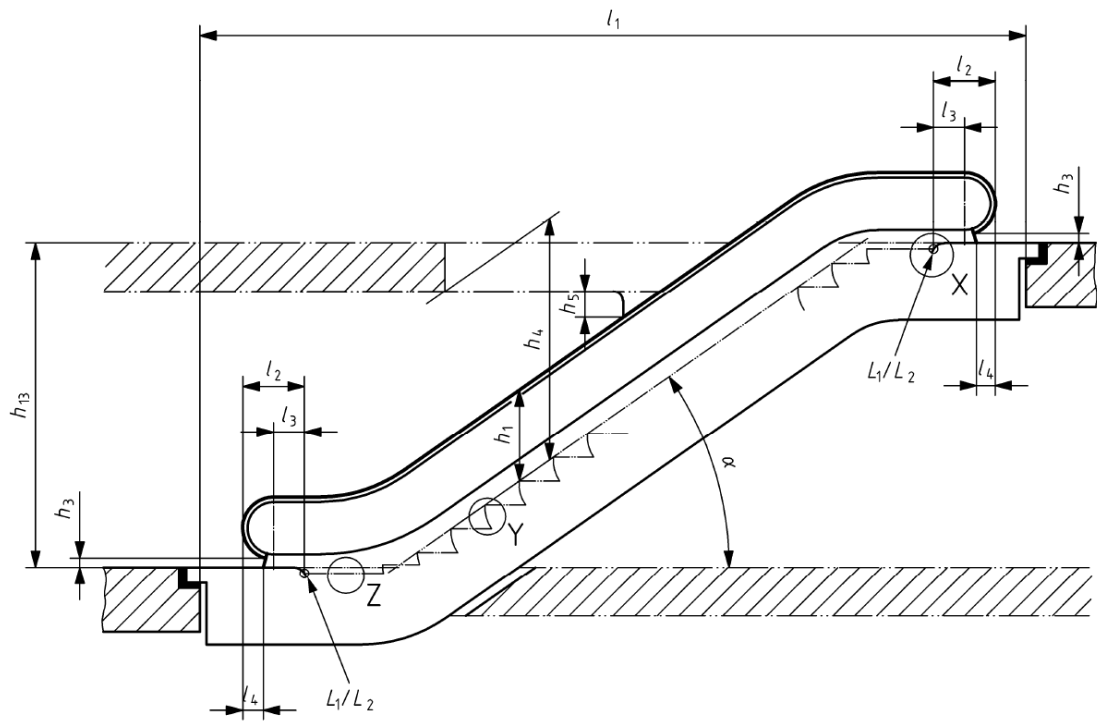
NOTE — This figure is not to scale, serves only to illustrate the requirements

FIG. 1 CLEARANCE BETWEEN BUILDING STRUCTURE AND ESCALATOR/MOVING WALK UNIT



NOTE — This figure is not to scale, serves only to illustrate the requirements

FIG. 2 EXAMPLE OF BARRIERS AT LANDINGS

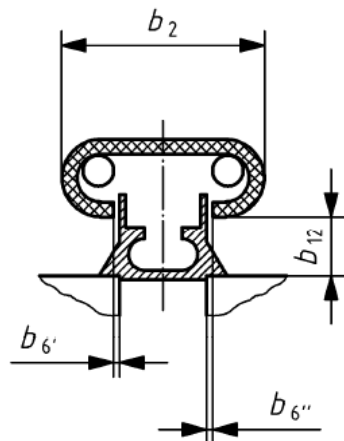


Principle dimensions	Clause
$h_4 \geq 2.30 \text{ m}$	6.2.1
$h_5 \geq 0.30 \text{ m}$	6.2.4

NOTE — This figure is not to scale, serves only to illustrate the requirements

FIG. 3 ESCALATOR (ELEVATION)

below the lower edge of the handrail (see b_{12} in Fig. 4). The area is permitted to be smaller, if by appropriate measures, the risk of injury is minimized.



Principal Dimensions	Clause
$b_{12} \geq 25 \text{ mm}$	6.2.2

FIG. 4 ESCALATOR/MOVING WALK
(HANDRAIL-SECTIONAL VIEW)

6.2.3 For escalators arranged adjacent to one another either parallel or criss-cross, the distance

between the handrails shall be not less than 160 mm (see b_{11} in Fig. 1).

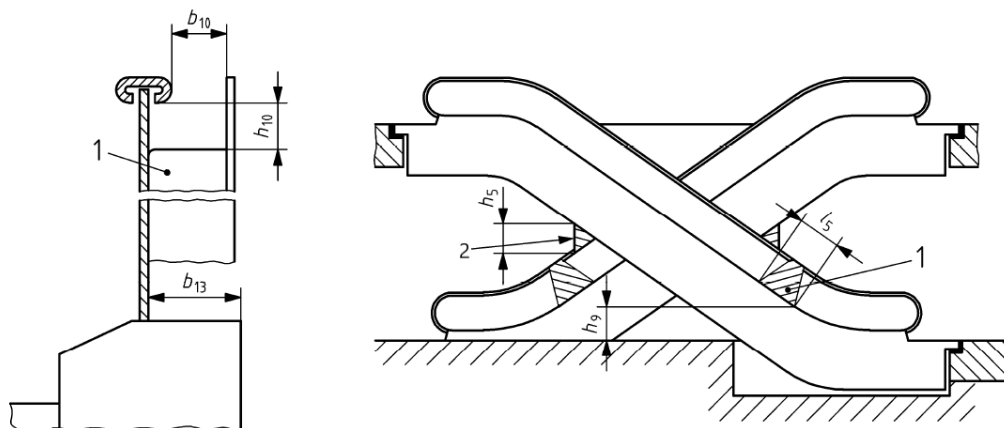
6.2.4 Where building obstacles can cause injuries, appropriate preventive measures shall be taken.

In particular, at floor intersections and on criss-cross escalators or moving walks, a vertical deflector of not less than 0.30 m in height, not presenting any sharp cutting edges, shall be placed above the handrail level and extend at least 25 mm below the lower edge of the handrail, for example, as an imperforate triangle (see h_5 in Fig. 3 and Fig. 5).

It is not necessary to comply with these requirements when the distance b_9 between the outer edge of the handrail and any obstacle is equal to or greater than 400 mm (see Fig. 1).

6.2.5 Possibility of overcrowding at destination floor, for example, should be considered. There should be enough space for passenger movement at entry floor and destination floor. The exiting passage at destination floor shall have adequate capacity for smooth flow of people discharged by the escalator, eliminating the possibility of overcrowding at that floor.

At the exit(s) of each individual escalator or moving walk, a sufficient unrestricted area shall be available to accommodate persons. The width of the unrestricted area shall at least correspond to the distance between



Legend

1 anti-climbing device

2 vertical deflector (6.2.4)

Principal Dimensions	Clause
$h_5 \geq 0.30 \text{ m}$	6.2.4

NOTE — This figure is not to scale, serves only to illustrate the requirements

FIG. 5 VERTICAL DEFLECTOR

the outer edges of the handrails plus 80 mm on each side. The depth shall be at least 2.50 m measured from the end of the balustrade. It shall be permissible to reduce it to 2.00 m if the width of the unrestricted area is increased to at least double the distance between the outer edges of the handrails plus 80 mm on each side.

For succeeding escalators and moving walks, the depth of an unrestricted area shall be determined in each individual case depending on for example, type of use (persons only or persons with transport devices, number of intermediate exits, relative orientation and theoretical capacity).

6.2.6 In the case of successive escalators and moving walks without intermediate exits, they shall have the same capacity [see also (viii) in IS 4591 (Part 1/Sec 1) Table 6].

6.2.7 Where it is possible for people to come into contact with the outer edge of a handrail at a landing and can be drawn into a hazardous situation, such as, toppling over a balustrade, appropriate preventative measures shall be taken (for an example, see Fig. 2).

Some examples are:

- a) Prevention of entry into the space by the placement of permanent barriers;
- b) Increasing the height of the building structure of the fixed balustrade in the hazard area by at least 100 mm above the handrail level and positioned between 80 mm and 120 mm from the outer edge of the handrail.

6.2.8 The surrounds of the escalator or moving walk shall be illuminated, especially in the vicinity of the combs.

NOTE — Information should be exchanged between the manufacturer and the customer.

6.2.9 It is permissible to arrange the lighting in the surrounding space and/or at the installation itself. The intensity of illumination at the landings including the combs shall be related to the intensity of illumination of the general lighting in the area. The intensity of illumination shall be not less than 50 lux at the comb intersection line measured at floor level.

6.3 Machinery Spaces outside the Truss

6.3.1 A safe access for persons to machinery spaces shall be provided.

6.3.2 Machinery spaces shall be lockable and only accessible to authorized persons.

6.3.3 Machinery spaces shall be provided with permanently installed electric lighting on the following basis:

- a) A minimum of 200 lux at floor level in working areas; and

- b) A minimum of 50 lux at floor level in access routes leading to these working areas.

6.3.4 Emergency lighting shall be installed to allow the safe evacuation of all personnel working in any machinery space.

NOTE — Emergency lighting is not intended for continuation of maintenance or other activities.

6.3.5 The dimensions of machinery spaces shall be sufficient to permit easy and safe working on equipment, especially the electrical equipment.

In particular there shall be provided at least a clear height of 2.00 m at working areas, and:

- a) a clear horizontal area in front of the control panels and the cabinets. This area is defined as follows:
 - 1) depth, measured from the external surface of the enclosures: at least 0.70 m; or
 - 2) width, the greater of the following values: 0.50 m or the full width of the cabinet or panel.
- b) a clear horizontal area of at least 0.50 m × 0.60 m for maintenance and inspection of moving parts at points where this is necessary.

6.3.6 The clear height for movement shall not be less than 1.80 m.

The access ways to the clear spaces mentioned in **6.3.6** shall have a width of at least 0.50 m. This value may be reduced to 0.40 m where there are no moving parts.

This full height for movement is taken to the underside of the structural roof beams and measured from both:

- a) the floor of the access area; and
- b) the floor of the working area.

6.3.7 In machinery spaces the clear height shall under no circumstances be less than 2.0 m.

6.4 Electric Power Supply

Agreements shall be made between the owner and the manufacturer about electric supply and electric protection requirements (for example, electric shock, short circuit, overload, etc).

The installation shall comply with IS 3043 and *Indian Electricity Act and Rules*.

7 ACCOMPANYING DOCUMENTS (IN PARTICULAR, INSTRUCTION HANDBOOK)

7.1 Contents

The instruction handbook or other written instructions shall contain among others:

- a) Information relating to transport, handling and storage of the escalator or moving walk, for example:

- 1) storage conditions;
- 2) dimensions, mass value(s), position of the centre(s) of gravity; and
- 3) indications for handling (for example, drawings indicating application points for lifting equipment).
- b) Information relating to installation and commissioning of the escalator or moving walk, for example:
 - 1) building interfaces (*see* 6);
 - 2) fixing/anchoring and vibration dampening requirements;
 - 3) assembly and mounting conditions;
 - 4) space needed for use and maintenance;
 - 5) permissible environmental conditions (for example, temperature, moisture, vibration, electromagnetic radiation, earthquake and civil defence);
 - 6) instructions for connecting to the power supply (particularly about protection against electric overloading);
 - 7) advice about waste removal/disposal; and
 - 8) if necessary, recommendations about protective measures which have to be taken by the owner; for example, additional safeguards, safety distances, safety signs and signals.
- c) Information relating to the escalator or moving walk itself, for example:
 - 1) detailed description of the escalator or moving walk, its fittings, its guards and/or protective devices;
 - 2) comprehensive range of applications for which the escalator or moving walk is intended, including prohibited usages, if any, taking into account variations of the original machine if appropriate;
 - 3) diagrams (especially schematic representation of safety functions and layout details);
 - 4) technical documentation about electric equipment;
 - 5) documents attesting that the escalator or moving walk complies with the relevant directives; and
 - 6) documents specifying the grade of the slip resistance.
- d) Information relating to the use of the escalator or moving walk, for example, about:
 - 1) intended use;
 - 2) description of manual controls (actuators);
 - 3) setting and adjustment;
 - 4) risks which could not be eliminated by the protective measures taken by the designer;
 - 5) interdiction to place merchandise between adjacent balustrades or between a balustrade and adjacent building structures;
 - 6) preventing arrangements in the vicinity of the escalator/moving walk which encourages misuse;
 - 7) keeping free of unrestricted areas (*see* 6.2.5);
 - 8) reasonably foreseeable misuse and prohibited usages;
 - 9) recommendation to not use escalators as regular staircases or emergency exits;
 - 10) recommendation that, for escalators and moving walks which otherwise would be exposed to weather conditions, the customer provides a roof or enclosure;
 - 11) fault identification and location, repair, and restarting after an intervention; and
 - 12) investigations and necessary corrective actions in case of faults requiring manual reset, to be taken before reset and restart.
- e) Information for maintenance, for example:
 - 1) necessity to follow the requirements of maintenance for escalators or moving walks;
 - 2) personal protective equipment which need to be used and training required;
 - 3) nature and frequency of inspections;
 - 4) instructions relating to maintenance operations which require a definite technical knowledge or particular skills and, hence, should be carried out exclusively by skilled persons (for example, maintenance staff, specialists);
 - 5) instructions relating to maintenance actions (for example, replacement of parts) which do not require specific skills and hence may be carried out by the owner;
 - 6) drawings and diagrams enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks);
 - 7) instructions relating to cleaning and refurbishment;
 - 8) necessity for the maintainer to observe a complete revolution of the step/pallet band before making the escalator/moving walk available to the public after maintenance; and
 - 9) instructions on the necessary use of inspection controls during maintenance and repair work.
- f) Information about periodic inspection and tests to ascertain whether the escalator or moving walk is safe in operation, including:
 - 1) electric safety devices with regard to their effective operation;
 - 2) brake(s) according to 4.2 d) of IS 4591 (Part 1/Sec 3);

- 3) driving elements for visible signs of wear and tear and for insufficient tension of belts and chains;
 - 4) steps, pallets or the belt for defects, true run and guidance;
 - 5) dimensions and tolerances specified in this standard;
 - 6) combs for proper condition and adjustment;
 - 7) interior panel and the skirting;
 - 8) handrails; and
 - 9) test of the electric continuity of the connection between the earth terminal(s) in the driving station and the different parts of the escalator or moving walk liable to be live accidentally.
- g) Information for emergency situations, for example:
- 1) the operating method to be followed in the event of accident or breakdown;
 - 2) use of hand winding device, if any [see IS 4591 (Part 1/Sec 1) 5.4.1.4 and 7.2.1.3]; and
 - 3) warning about possible emission or leakage of harmful substance(s), and if possible indication of means to fight their effects.
- h) A declaration that the emission sound pressure level measured under free field conditions at a distance of 1.0 metre from the surface of the machinery and at a height of 1.6 metres from the floor plate is expected not to exceed 70 dB(A).

7.2 Presentation of the Instruction Handbook

- a) Type and size of print shall ensure the best possible legibility. Warning signs and/or cautions should be emphasized by the use of colours, symbols and/or large print.
- b) Information for use shall be given in the language(s) of the country in which the escalator or moving walk will be used for the first time and in the original version. If more than one language is to be used, each language should be readily distinguished from the other(s), and efforts should be made to keep the translated text and the relevant illustration together.
- c) Whenever helpful to the understanding, text should be supported by illustrations. Illustrations should be supplemented with written details enabling, for instance, manual controls (actuators) to be located and identified. They should not be

separated from the accompanying text and should follow sequential operations.

- d) Consideration should be given to presenting information in tabular form where this will aid understanding. Tables should be adjacent to the relevant text.
- e) The use of colours should be considered, particularly in relation to components requiring quick identification.
- f) When information for use is lengthy, a table of contents and/or an index should be given.
- g) Safety-relevant instructions which involve immediate action should be provided in a form readily available to the operator.

7.3 Advice for Drafting and Editing Information for Use

- a) The information shall clearly relate to the specific model of escalator or moving walk.
- b) When information for use is being prepared, the communication process “see – think – use” should be followed in order to achieve the maximum effect and should follow sequential operations. The questions “how?” and “why?” should be anticipated and the answers provided.
- c) Information for use shall be as simple and as brief as possible, and should be expressed in consistent terms and units with a clear explanation of unusual technical terms.
- d) Documents giving instructions for use should be produced in durable form (that is, they should be able to survive frequent handling). It may be useful to mark them “keep for future reference”. Where information for use is kept in electronic form (for example, Pen drive, CD, DVD, tape) information on safety-related issues that need immediate action shall always be backed up with a hard copy that is readily available.

8 MARKING

At least at one landing, the following shall be marked:

- a) name and full address of the manufacturer and, where applicable, his authorized representative;
- b) designation of series or type of the machinery;
- c) serial number; and
- d) year of construction (year in which the manufacturing process is completed) shall be indicated, visible from the outside.

ANNEX A*(Foreword)***COMMITTEE COMPOSITION**

Lift and Escalators Sectional Committee, ETD 25

<i>Organization</i>	<i>Representative(s)</i>
Central Public Works Department (CPWD), New Delhi	SHRI C. K. VARMA (Chairman)
Chief Electrical Inspector, Maharashtra	SHRI S. R. BAGDE
Chief Electrical Inspectorate, Tamil Nadu	SHRI T. AI. TENAPPAN SHRI D. KARTHIKEYAN (<i>Alternate</i>)
Chief Electrical Inspectorate, Maharashtra	SHRI N. G. BEHRAM SHRI V. H. SHAHARE (<i>Alternate I</i>) SHRI D. M. NIKHATE (<i>Alternate II</i>)
Chief Electrical Inspectorate, Energy & Petrochemical Department Government of Gujarat	SHRI HAIDERALI H. KHOJA SHRI ASHWIN B. CHAUDHARY (<i>Alternate I</i>) SHRI GOPAL K. PRAJAPATI (<i>Alternate II</i>)
Electrical Inspectorate, Labour Deptt, Govt of NCT of Delhi	SHRI MUKESH KUMAR SHARMA SHRI JOGENDER SINGH (<i>Alternate</i>)
Delhi Metro Rail Corporation Limited	SHRI MANUJ SINGHAL SHRI MANJEET KUMAR (<i>Alternate I</i>) SHRI SUMIT KUMAR SHARMA (<i>Alternate II</i>)
Maharashtra Industrial Development Corporation (MIDC) Fire Service	SHRI SANTOSH S. WARICK
Electrical Contractors Association of Maharashtra	SHRI ANIL GACHKE
Fujitec India Pvt Ltd, Tamil Nadu	SHRI S. P. RAO SHRI R. RAJESH (<i>Alternate I</i>) SHRI ARUNSANKAR M. S. (<i>Alternate II</i>)
Johnson Lifts Pvt Limited, Chennai	SHRI T. SUBRAMANIAN SHRI V. KARTHIKEYAN (<i>Alternate</i>)
Kone Elevator India Private Limited, Chennai	SHRI TIPNIS P. M. SHRI P. GURUMOORTHY (<i>Alternate I</i>) SHRI U. VISWANATHAN (<i>Alternate II</i>)
Lerch Bates Private Limited, Mumbai	SHRI SUMEET MAJUMDAR SHRI PRASHANT KULKARNI (<i>Alternate</i>)
Otis Elevator Company (India) Limited, Mumbai	SHRI VIJAY JAYCHANDRAN SHRI ABHIJIT DANDEKAR (<i>Alternate I</i>) SHRI H. N. PRASHANTH (<i>Alternate II</i>)
Schindler India Pvt Ltd, Mumbai	SHRI NIMISH DESHPANDE SHRI RONNIE DANTE (<i>Alternate I</i>) SHRI NITIN KADAM (<i>Alternate II</i>)
Tak Consulting Private Limited, Mumbai	SHRI TAK MATHEWS SHRI WILLIAM REBELLO (<i>Alternate</i>)
Thyssenkrupp Elevator India Pvt Ltd, Mumbai	SHRI VISHNU PARASHAR SHRI RAJESH JOSHI (<i>Alternate</i>)
BIS Directorate General	SHRI RAJEEV SHARMA, SCIENTIST 'F' AND HEAD (ETD) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary

MS MEGHNA MUDGAL
SCIENTIST 'C' (ETD), BIS

(Continued from second cover)

The composition of the Committee, responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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This Indian Standard has been developed from Doc No.: ETD 25 (11982).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi